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A QUARTERLY ILLUSTRATED MAGAZINE DEVOTED TO ALL SUBJECTS CONNECTED WITH THE NAVIGATION OF THE AIR.

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MAJOR F. C. TROLLOPE.

(Late Grenadier Guards),

DELEGATE OF THE BRITISH GOVERNMENT AT THE PARIS INTERNATIONAL AERONAUTICAL CONGRESS.

THE AERONAUTICAL JOURNAL.

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NOTICES OF The Aeronautical Society.

A meeting of the Council was held on September the 25th, when the following gentlemen were elected Members of the Society :—

MR. WILLIAM FRANCIS COOPER, B.A.

MR. CHARLES J. DAVIES.

The next General Meeting of the Aeronautical Society will be held in the rooms of the Society of Arts, John Street, Adelphi, in April next, the date of which will be duly announced.

For this occasion Monsieur Wilfred De Fonvielle, late President of "La Société Française de Navigation Aerienne," will come specially from Paris to London to address the Members of the Aeronautical Society of Great Britain (in English).

Monsieur Jacques Faure (the Treasurer of the Paris Aero-Club), who will also come specially from Paris, will read a paper on "Nautical Ballooning."

Mr. Charles Groombridge (Member of the Aeronautical Society), will exhibit and explain his new Propeller for Aeronautical Purposes.

There will be a demonstration of the "Meteoparachute," a new instrument for investigating the upper atmosphere, by Eric Stuart Bruce, Esq., M.A., F.R.Met.Soc.

During the evening a series of lantern slides illustrative of the trial trips of the Zeppelin Airship and M. Santos-Dumont's Navigable Balloon will be projected on the screen.

Members are reminded that they have the privilege of introducing two friends to the General Meetings of the Society.

Members and Correspondents of the Aeronautical Society are reminded that the present address of the Aeronautical Society is 19, Campden House Road, Kensington, London, W., and that all communications should be addressed to the Honorary Secretary to that address.

ERIC STUART BRUCE,
Honorary Secretary.

THE NEW YEAR HONOURS.

THE Members of the Aeronautical Society of Great Britain will unite in congratulating Sir Hiram Maxim, a Member of the Council of the Society, on the honour of Knighthood which Her Majesty has been pleased to bestow on him in recognition of his distinguished services in the cause of Scientific Invention. Sir Hiram Maxim has won world-wide renown for the auto-

matic gun which bears his name, but perhaps it is his Flying Machine that will secure him still more enduring fame. It may be said without exaggeration that Sir Hiram Maxim has done more than any other experimenter to show the world one possible future of air navigation by machines that are heavier than air, and all his work has been based on sound scientific principles. Perhaps one of the most commendatory features concerning his aeronautical researches has been the absence of any sensational element, which has often in the past characterised the too premature efforts of the enthusiastic, and ended in both failure and tragedy.

The Editor much regrets that the portrait and biographical sketch of Mr. A. Lawrence Rotch, the originator and director of the Blue Hill Meteorological Observatory, and who was one of the official delegates representing the American Government at the Paris Congress, was received too late for insertion in this number. They will, however, duly appear in the next number.

The Paris International Aeronautical Congress.

The Paris International Aeronautical Congress, which, under the Presidency of M. Janssen, was held at the Meudon Observatory last September, and which attracted distinguished representatives in Aeronautical Science from the principal countries of the world, was an undoubted success. It is however, to be regretted that Great Britain contributed comparatively few names to the list of the members of the Congress, and that our own Aeronautical Society was not more largely represented. The importance of the Congress was, however, fully realised by the stress and strain of having several balloon British Government, who, in the midst of the equipments engaged in the great struggle in South Africa, and sending another to China, yet did not neglect to send a delegate to represent the British Government at this important international meeting—a delegate so versed in practical ballooning as Major Trollope, the present acting superintendent of the balloon factory at Aldershot, whose portrait and biographical sketch appear on the pages of this Congress number of the journal.

Perhaps the explanation of a deficiency in the number of British savants who attended the Congress is explained by the fact that the practical British nation has not yet thoroughly realised that there are a sufficient number of practical issues likely to arise from the study of aeronautics to justify a lavish expenditure of its intellect and skill. But even if aerial locomotion seems yet but a distant dream, and the fancied delightful independence of the truly navigable balloon and flying machine are far from realisation, still, there are other eminently practical advantages to be gained by the pursuit and practice of aeronautics. Putting aside the great and important use of the balloon as an addition to our national defences in military and naval service, let us consider the application of the science of aeronautics to the extension of meteorology. Aeronautics alone can provide the instruments to grapple with the great unknown problems of the upper atmosphere. The newer meteorology is, in fact, dependent on aeronautics for its existence as a science for terrestrial meteorology is only a limited branch of the great science of the aerial ocean. Useful, indeed, is the latter, as it deals with those climatic influences which, owing to terrestrial interferences with atmospheric laws, act for weal or woe upon mankind; but researches in the former can alone impart a knowledge of the laws that regulate the complex vertical and horizontal motions of the atmosphere of our planet. But to what practical purpose could such a store of knowledge be applied. One probable practical result may be cited as being worthy of the energy of a nation which only needs to clearly see the practical, and to devote to it its characteristic energy. That is the attainment of long and certain weather forecasts in place of short and uncertain ones. Thousands of other practical issues hang upon forecasting the weather aright. What disasters at sea might be averted if mariners had longer warnings of those periodic gales which strew the shores

with shipwrecked vessels. How advantageous to the farmer it would be if he had longer foreknowledge of thunderstorm which follows the spell of drought, which floods the fields of new-mown hay, and stops short the ingathering of the harvest. Or still more beneficial to mankind would be predictions of the furies of tornadoes and whirlwinds.

If ever such prophetic skill is the attribute of man, it will be acquired by the high flights of recording balloons and kites into the upper atmosphere.

Though the Paris Congress largely dealt in its sections with the problem of aerial locomotion, yet the new application of scientific kite-flying to atmospherical research was largely dealt with, and this part of the programme might well have attracted a large and representative contingent of British meteorologists. In kite-flying, America has taken the lead, and high-kite flights have there become the recognised method of attaining a knowledge of the upper atmosphere. Therefore, it was, perhaps, not surprising that this country supplied the Congress with no less than five delegates representing their Government. In reference to American kite-flying, attention may be drawn to the report of the kite observations of 1898, published by the United States Department of Agriculture, to be reviewed in the next issue of this journal. Equally important as scientific kite-flying though as yet not so developed are the ascents of the "ballons sondes," or, as they may be otherwise called, self-recording balloons. These carry no passengers, only the self-recording instruments—barometers, hygrometers and thermometers. Consequently they can attain very high altitudes in such a rarefied condition of atmosphere, as no human explorer could possibly survive. For instance, in April 1895, the Cirrus rose to 72,000 feet, which is over 13¼ miles, and where the barometric pressure was reduced to one and a half inches of mercury. In recent years, ascents by these "ballons sondes" in various countries have formed part of the programme of the International Aeronautical Commission, and it has been in the past a reproach to this country that we have not shared in these aeronautical experiments that have simultaneously been conducted in Paris, Brussels, Berlin, Warsaw, St. Petersburg, Strasburg, Munich and Vienna. One beneficial result of the late Congress is that this reproach is now removed from Great Britain, as our country has now undertaken to assist in this important aeronautical and meteorological effort. In another part of this journal will be seen the record of the first ascent of a "ballon sonde" in England at Bath, the ascent being conducted by Mr. P. Alexander, who is undertaking these ascents for this country.

The diversified programme of the Congress reflects the highest credit on its organisers. The proceedings extended from September 15th—21st. The afternoon of the 15th was devoted to the opening meeting, including the Discourse of the President. On the morning of the 16th the work of the sections was commenced at the Institute de France. In the afternoon at the annexe of the exhibition at Vincennes, there was the reception of the members of the Congress by the organising committee of the Aeronautical Competitions at Vincennes. There was also the balloon competitions in the "Parc d'Aerostation." On the morning of the 17th, there was a discourse by Commandant Paul Renard on "The Present Position of Aeronautics" in the Meudon Observatory. In the afternoon a visit was made to the aeronautical section of the exhibition, and an ascent of the Eiffel Tower was made. On the 18th, in the morning, there were discourses by M. Teisserenc de Bort, M. Assmann of Berlin, M. Rotch of Blue Hill. In the evening the members of the Congress paid a visit to the Chateau of Chantilly. On the 19th, the morning was devoted to a visit to the meteorological observatory at Trappes.

In the afternoon, M. Santos Dumont gave a demonstration of his navigable balloon in the "Parc d'Aerostation" of the Aero-Club. In the evening there was a soirée and reception of the members in the salons of the Aero-club. This reception was one of the most brilliant features of the Congress, speeches being made by M. le Comte de La Valette, M. Janssen, Commandant Paul Renard. There were also admirable discourses by Mlle. Klumpke, M. Henry Deutsch de La Meurthe, and M. Emmanuel Aime.

On September 20th, the work of the four sections was resumed. In the afternoon the members made an excursion to the Central Military Aeronautical Establishment at Chalais. On the 21st the business of the sections was concluded. In the afternoon the closing meeting was held at the Meudon Observatory, when the Permanent International Aeronautical Commission was nominated. In the evening there was a banquet in the Orangery at Meudon. This finally concluded the gathering of the world's aeronauts. The banqueting hall had been most fitly selected

for its historical associations. Here it was that the first military balloons of the first Republic were constructed under the direction of Coutille and de Comte.

It will be seen that the programme of the Paris Aeronautical Congress, while it devoted so many hours to the vigorous discussion of those scientific problems which it is the aeronaut's aim to solve, did not neglect to provide pleasant recreation and opportunities of friendly intercourse so essential to the success of international gatherings.

The Presidential Speech.

Monsieur Janssen commenced his presidential oration by complimenting the organising committee on the zeal they had displayed in preparing the International Aeronautical Congress, and he gave a hearty welcome to the strangers of all nationalities who had so cordially responded to the invitation to take part in its proceedings. He then gave a sketch of the progress made in aeronautical science since the last International Congress held in Paris in 1899. He pointed out that it was the necessities of the Siege of Paris in 1870 that inspired fresh attention to the use of balloons and pigeons in warfare, a use which had been quite overlooked in France since the First Empire. The Government was not long before it occupied itself with the organisation of a special military balloon and pigeon service. For this purpose was the fine establishment at Chalais organised, where not only balloons and their accessories are manufactured and the necessary instruction for their management in warfare imparted, but where, also, opportunities can be given for a close study of the possibilities of improvement in aeronautical machinery and accessories. Though France led the way in military ballooning, several other European nations—Germany, Russia, Italy, and Great Britain—soon followed its example, with the result that several important improvements have been made which have tended to enhance the importance which military balloons now possess. One fact is worthy of mention. This is the loan of the military balloons in Germany and Russia for the purpose of scientific investigation.

Military ballooning is destined to play a great part in the warfare of the future, and, already, the recent American and Transvaal Wars have been object lessons in showing the usefulness of the balloons to the generals in command.

Though, thus speaking in praise of the recent advances in military ballooning, M. Janssen did not fail to point out that after all the great desideratum of the balloon has yet to be discovered, viz., its navigation.

Since 1889 this great problem has incessantly occupied the attention of the aeronaut; but, it has to be confessed that in spite of the interesting experiments that have been carried out, and which have been worthy of all encouragement, no decisive solution of the problem has been made. In Berlin two very daring experiments have ended in a tragedy. But these failures have by no means discouraged further experiment. Examples of fresh enterprise are afforded in the experiments of M. Santos Dumont, who is striving after the prize of 100,000 francs founded by M. Deutsch, and in Count Zeppelin's experiments on the Lake of Constance with his extraordinary elongated airship of 117 metres long and propelled by two petroleum engines which act on four screws.

M. Janssen reminded his hearers that the direction of the balloon against the wind was the first and most important problem the aeronaut had to solve; still, other points were of great importance, such as the attainment of great heights in balloon ascents, remaining in the atmosphere without descending for as long a time as possible, and the accomplishment of very long journeys.

As an example of height attained, he quoted the record of M. Berson, who attained a height of more than 9,000 metres with the help of the inhalation of oxygen. As an example of distance attained, he drew attention to the journey of Count de Castillon de Saint Victor from Paris to Sweden, when he covered a distance of over 1,300 kilometres. As an example of duration he cited the journey of Count de La Vaux who was 30 hours in his balloon without touching the ground. He also mentioned the journey of M. Mallet, who, in eight days, made a tour of France in the same balloon, though the journey was broken with descents. But, as will be seen in another article in this journal, the record of distance and duration mentioned in the President's address has been beaten since its delivery.

M. Janssen emphasized the importance of the recent scientific balloon ascents that have taken place in Germany under the auspices

of the Berlin Aeronautical Society. During the last five years, no less than 75 such ascents have been carried out.

The President made graceful allusion to the memory of those aeronauts which the world has lately lost. Eugene Godard, the instigator of the balloon service during the Siege of Paris; Hureau de Villeneuve, who founded the journal l'Aeronaut; Gaston Tissandier the patriotic aeronaut of the armies of La Loire, the witness of the terrible drama of the "Zenith," and the founder of that valuable journal "Na Nature"; lastly, Coxwell, the famous aeronaut who piloted M. Glaisher in his scientific ascents.

In concluding his speech, M. Janssen, in eloquent language, drew a picture of the supremacy that nation would have who would be first master of the aerial ocean—a picture fearful to contemplate. But to modify the honor of the possibilities of aerial warfare—the "ghastly dew from the nations' airy navies grappling in the central blue." M. Janssen held out the fervent hope that by the time the conquest of the air has been completed, man will have reached such a finesse of civilization, that it will have resulted in the pacification of nations.

The Sectional Subjects at the Paris Congress.

It is impossible, through want of space, to give a complete list of the various papers read and discussed at the Aeronautical Congress, and it must suffice to give the titles of some of the most important.

SECTION I.

AÉROSTATION.

Thermosphère Dirigeable.—*Aimé.*

Navigateur à Poche Natatoire.—*Bonneil.* Déviation des ballons par les guideropes drouillard.

Signaux à Grande Distance à bord des Aérostats libres ou captifs.—*Dibos.*

Stabilité Statique.—*Hervé.*

Production de l'Hydrogène.—*De Tomilowski.*

SECTION II.

AVIATION.

Note sur l'Aviation Militaire.—*Ader.*

Force des Hélices.—*Alexander.*

Le Dynamoptère.—*Berthenson.*

Etude sur le Vol Plané.—*Bretonnière.*

Etude sur la Resistance de l'Air.—*Clerc.*

Expériences sur la Resistance des Fluides.

SECTION III.

INSTRUMENTS.

Les Voyages Aériens Scientifiques.—*Assmann.*

Theorie de la Formation de l'Auréole.—*Bouquet de la Grye.*

Ballons Lumineux aux Signaux.—*Bruce.*

L'Auréole de Aéronautes.—*De Fonvielle.*

Le Service de Cerfs Volants à Blue Hill.—*Rotch*

Photogramétrie.—*Triboulet.*

SECTION IV.

LEGISLATION.

Du Rôle des Aérostiers lors de la Campagne d'Egypte.—*De Villiers.*

Des Devoirs des Aéronauts.—*J. Faure.*

The International Permanent Aeronautical Commission.

The composition of the International Permanent Aeronautical Commission elected at the close of the Paris Congress is as follows:—

President:
M. JANSSEN.

Vice-Presidents:
MM. MAREY, COLONEL CHARLES RENARD.

General Secretaries:
M. L. TRIBOULET and M. HENRI HERVÉ.

Secretary of Meetings:
CAPT. VOYER.

Treasurer:
M. CASSÉ.

Foreign Vice Presidents:
Russia, GENERAL RYKATCHEFF.
Germany, M. HERGESELL.
United States, M. LANGLEY.

Foreign Secretaries:
Great Britain, M. PATRICK ALEXANDER.
Germany, M. EMDEN.
Italy, MM. SCHIAVONE, LE CHEVALIER PESCE.

French Members:

M. Teisserenc De Bort, Commandant Hirschauer, Comte de la Vaux, Comte de la Vallette, Commandant Paul Renard, M. Hervé, Lieutenant de Vaisseau Tapissier, M. Surcouf, M. La Chambre, M. Mallet.

Foreign Members:

Mr. Rotch (America), MM. Assmann, Moedebeck (Germany), Major Trollope (Great Britain), Commandant Hinterstoiser (Austria), Commandant Millard (Belgium), M. Canovetti (Italy), Professor Joukowski (Russia), Colonel Stroh (Switzerland).

The Permanent Aeronautical International Commission in its meeting of Dec. 20th at the Institute, nominated several sub-committees to examine the resolutions made by the Congress of 1900.

These resolutions concern principally—1 The employment of those astronomical methods which permit of the work being done in a balloon; 2 The precautions to be taken in the preparation and execution of long aerial voyages; 3 The means of preventing accidents of poisoning by impure hydrogen; 4 The establishment of an international association to safeguard the interests of aeronauts in all countries.

Other sub-committees to consider the remaining resolutions of the Congress will be nominated at a future meeting.

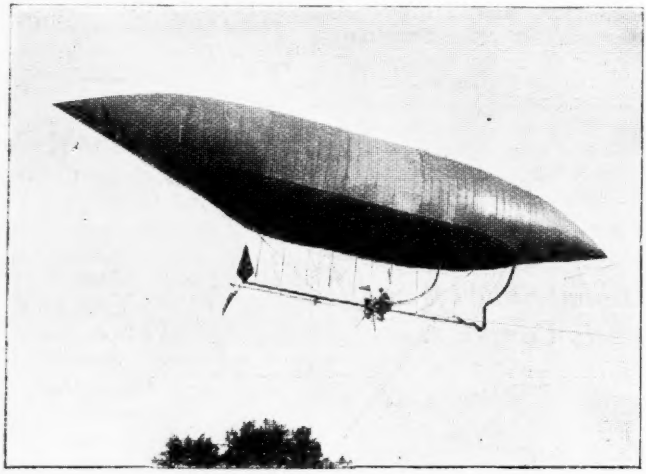
The Permanent Commission at its first sitting on the 8th of December, nominated the sub-committee of the "Aeronauts' Certificates," a most important safeguard for aerial travellers, whose numbers increase daily.

The Committee has further decided to supply those newspapers who may wish for it with an official account of each of its meetings.

Mr. Santos Dumont's Navigable Balloon.

By a Member of the Paris Aero-Club.

In the notes of the last number of this journal, mention was made of M. Santos Dumont's unsuccessful attempt to win the Grand Prize of the Paris Aero-Club. By the courtesy of the editor of the "Illustrated Mail," we are enabled to reproduce an excellent picture of this new navigable balloon. The following details of its construction may be of some interest to our readers.



M. SANTOS DUMONT'S NAVIGABLE BALLOON.
(By kind permission of the Editor of the "Illustrated Mail.")

The elongated balloon has a capacity of 334 cubic metres. The surface of the balloon comprises 292 square metres. Its length is 28 metres 50 centimetres. Its diameter surface is 24 square metres. The bicycle seat on which the aeronaut sits is suspended 5 metres 30 centimetres below the centre of the balloon. The material of the balloon is Japanese silk. It weighs 57 kilos, which includes the weight

of the inner air chamber of 35 cubic metres volume. The weight of the ropes and tackle is 6 kilos. The screw is made of aluminium and steel covered with silk. This is four metres in diameter. Its weight is 27 kilos, and it makes 100 revolutions a minute. It is worked by a ten-horse power motor. There is a rudder 6 metres 50 centimetres in surface. This works on a hinge attached to the balloon.

The valvular arrangements are somewhat complicated. There is an upper valve for regulating the vertical motions of the balloon. This is 49 centimentres in diameter. There are two lower valves provided for automatically regulating the escape of hydrogen at a pressure of 15 millimetres and 18 millimetres of water. The diameter of these valves is 20 centimetres. Then there is another lower valve of the same diameter which automatically regulates the outflow of air from the inner air chamber at a pressure of 9 millimetres of water. The air is driven into the air chamber by means of a fan worked by the motor. The presence of this inner balloon secures the retention of the shape of the balloon by keeping up a normal tension of the envelope. This preservation of the shape of the balloon is considered essential, as it facilitates the motion of the balloon through the air.

The Vincennes Competitions.

By Helen Auxilium Bruce.

Communication from the Aero-Club, of Paris. October 5th, 1900.

"The first French balloon voyage to Russia, a distance of 1,300 kilometres in 21 hours.

"Comte Henri de la Vaulx communicates to the Aero-Club the synopsis of his voyage to Russia in the balloon 'Centaur' of 1,600 cubic metres. Starting alone in his balloon, as did also the Comte de Castillon de St. Victor and M. Jacques Faure in the balloons 'L'Orient' and 'L'Aero-Club,' he found his level between 2,000 and 3,000 metres, and through the night flitted above a sea of clouds. In the morning he dropped a little and recognised the plains of Germany; then the 'Centaur,' under the heat of the Solar rays, rose up again into the higher regions, and at 2.15 in the afternoon came to land gently, outside Wocawek in Russian Poland. The 'Centaur,' with the flight of a bird, had travelled over 1,300 kilometres.

"When M. de la Vaulx landed he still had 100 kilos of ballast and could have travelled further, but he was afraid of coming down in an uninhabited Russian steppe, and of not getting back to

THE COMPETITORS IN THE GREAT BALLOON RACE OF OCTOBER 9TH, 1900.

By kind permission of the Editor of the "Illustrated Mail.")

Paris in time for the champion race of the next Sunday. So he decided to land by a town, and it was fortunate he did so, for, in spite of having the railway and telegraph at hand, he was kept prisoner for over 24 hours, while the Governor-General of Varsovie obtained his instructions and gave the necessary orders to permit of his recrossing the frontier. Had M. de la Vaulx journeyed further, he would have fallen on the desert lands beyond the governorship of Varsovie, he would have had to obtain the necessary permit for return from headquarters at St. Petersburg, and his arrival in Paris would certainly have been very much delayed. He relates that his captivity was light and easy, and that the friendly Russian authorities fêted his unexpected arrival in the allied country by numerous bottles of champagne and other wines.

"This journey is another active success for the Aero-Club, one of whose balloons for the first time has united right across the vastness of Germany, the two nations who are already one in the bonds of friendship.

The General Secretary,
EMMANUEL AIME."

The interesting communication, which I have just translated above, from the Secretary of the Aero-Club, was at the moment of its reception considered the distance feat of the Vincennes competitions, almost rivalling that of 1899 of Comte de Castillon de St. Victor and M. Mallet—Paris to Sweden, 1,335 kilometres in 24 hours. Since then it has been beaten by a record of both distance and time of remaining up, which has obtained for Comte Henri de la Vaulx the Grand Prize for aeronautics of the Exhibition.

Practical persons, when considering the Aeronautical Congress, turned with greatest interest to the Vincennes Competitions. These competitions in the Aerostatic Park of the Universal Exhibition, were arranged by the organisation committee of section X, and were announced in the issue of the "Aeronautical Journal" of last July. There were fourteen balloon competitions between the 17th of June and the 9th of October. There were 158 ascensions and no accidents. 325 persons ascended.

Though the competitions were international, all the balloons were French. And in view of the results obtained, France may well be gratified, and other countries feel regret that they were unrepresented. The record of the world for distance travelling and for length of staying-power was obtained a sum of experience which must bear fruit, and an accumulation of scientific observations of the value and place of which it is as yet premature to decide. Of course, Great Britain, with wars upon her hands, and many of her leading aeronauts in the field, was not in a position to attempt to share in the French enterprise; and to those who know what practical ballooning is, it is a continual marvel that Great Britain has done what she has, evolved the finest practical balloon material, a system of signalling, and a working military balloon establishment, handicapped as she is by her geographical position. Anyone who goes up in a balloon in England for a voyage of any respectable distance, runs a fair chance of passing the night in the sea, and our weather of samples supplies a wind variation that calls ceaselessly on the national fund of doggedness and patience when planning ascents in advance. Those who ascend in balloons on the European continent, on the contrary, may calculate on the risks of land descent rather than on the yielding watery grave.

The long distance record was obtained on October the 9th by Comte Henri de la Vaulx, who landed in Russia, at Korosticheff, a distance of 1,925 kilometres in 35 hours 45 minutes. M. J. Balsan and Louis Godard, on the same day, also beat the previous distance record of 1899, descending at Rodom in Russia, a distance of 1,360 kilometres in 27 hours 15 minutes.

The distance competitions of August 12th and August 26th were cut short by arrival at the sea.

In the three altitude competitions, nearly all the balloons descended in the department of Marne; this is considered by M. Eugene Godard to indicate in the higher atmosphere a persisting current to the east. What light we want on the currents of the higher atmospheres! Here is all the secret of a practical system of ballooning! The two highest altitudes of these competitions were obtained on the 23rd of September by M. J. Balsan and Louis Godard, 8,417 metres, with a difference of less than 42 degrees Centigrade, and M. G. Juchmes with 6,877 metres.

The winds, most frequent on the days of competition, were between west and south-west.

The ascent of the 16th of September, saw no less than 26 balloons with a tonnage of 23,311 cubic metres of gas.

The greatest speed was obtained by M. de la Vaulx on the 26th of August, when he traversed 42 kilometres with a speed of about

62 kilometres an hour (17 metres a second), and slowness of speed was the appanage of M. G. Juchmès, who, on the 16th of September, went 30 kilometres only in 16 hours 5 mins., less than 2 kilometres an hour.

For staying power in the air, M. Jacques Balsan, on the 16th of September, ran up very close to M. de la Vaulx's later Russian record of the 9th of October. M. de la Vaulx's record was 35 hours 45 mins. without a descent, while M. J. Balsan's was 35 hours 9 mins. in his journey from Paris to Belgium.

At the head of this article is an illustration of some of the competitors in the long-distance race of the 9th of October, which, by the courtesy of the editor of the "Illustrated Mail," I am able to reproduce. Reading from left to right, the 2nd in the group is M. Hervieu; No. 3 is M. Balsan; 4 M. Jacques Faure; 5 Le Comte H. de la Vaulx; 6 M. Juchmès; 7 M. Maison. M. Jacques Faure was 3rd in the long-distance competitions of 30th September and 9th of October. He is another illustrious member of the Aero-Club, and a notice of him appears in another portion of this journal.

The Aero-Club, the child of the Automobile Club, is just now one of the most living powers of aeronautics. The scientific records of its members are expanding the confines of our knowledge of meteorology, astronomy, and aeronautics. In two years 20 balloons have been made for members of the Aero-Club, and 300 ascents have been carried out. Its President is M. le Comte de Dion, and its Secretary is M. Emmanuel Aimé, who sent to the Secretary of the British Aeronautical Society the communication with which this article opens.

M. Aimé is the inventor of the thermosphere. The thermosphere is a balloon partially filled with hydrogen, which is expanded and condensed at will by the introduction of steam, heated by petroleum in the car, with the object of regulating without sacrifice the vertical motion of the balloon. M. Aimé has always persistently advocated the use of the vertical motion of the balloon so as to utilise the various layers of horizontal currents. He first brought forward his views at the Aeronautical Congress in 1889, and since then has been at work in endeavouring to practically further them. The scientific world is awaiting, with interest, the trial of the thermosphere.

In addition to the balloon competitions at Vincennes, there were kite competitions, but the wind was capricious, and dropped on two of the occasions when the kites were admitted. Nevertheless, M. Teisserenc de Bort, with an admittedly inferior kite, beat Mr. Rotch's present Blue Hill height record of 4,815 metres by getting his kite up to 4,900 metres.

Some Celebrities of the Paris Congress.

1.—M. JANSSEN.

It is with much satisfaction that we present to our readers a reproduction of the excellent portrait of M. Janssen, which that illustrious scientist has recently presented to the Aeronautical Society of Great Britain. The Paris Congress was certainly to be congratulated on having secured for its President one so distinguished in original research and discovery as the Great French Physical Astronomer.

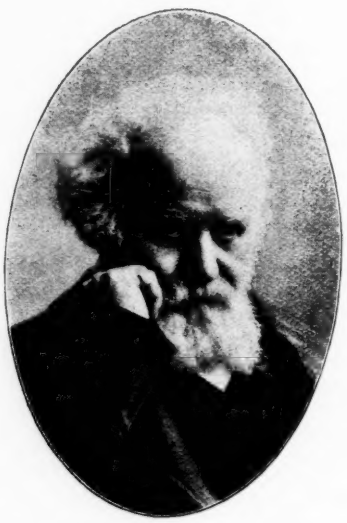
M. Janssen was born in Paris on February 22nd, 1824. He is the son of an eminent musician, Antoine Cesar Janssen. It was in his thesis for his degree of doctor of science, that his subtle originality was first prominently displayed. In that work he pointed out the important fact of the absorption of heat rays by the eye. The master work of the philosopher has undoubtedly been his contributions to new knowledge in spectrum analysis, and at an early stage in his career he showed the part that the terrestrial atmosphere plays in the production of the lines of the solar spectrum—a discovery which so impressed the French Academy, that M. Janssen was sent to Italy by that body in 1862, so that he might pursue his investigations in an advantageous climate.

In further pursuit of fresh evidence, M. Janssen, in 1864, spent a week at the summit of the Faulhorn, and by actual experiment at the Lake of Geneva, confirmed the terrestrial origin of certain lines. Soon after these discoveries, M. Janssen proved that some of these were due to the presence of water vapour in the atmosphere. This discovery of the spectrum of water vapour was exceedingly important, as, by its means, it has been found possible to ascertain the existence of water in the atmospheres of the planets and stars. The work of finding water in the atmosphere of Mars was accomplished by M. Janssen, and this was the first contribution to our know-

ledge of the chemical constitution of a planet's atmosphere.

In 1868, M. Janssen went to India to observe the greatest eclipse of the century, and apply the principles of spectrum analysis to eclipse phenomena. It was during this expedition that he discovered the well-known method which rendered it possible to take several observations of solar prominences and other coronal phenomena without waiting for the rare moments of eclipse.

tion, where the historic balloon "La Volta" was on view, the story was told how M. Janssen despised asking permission from the Germans to leave the city to go on a scientific expedition, and independently sailed over the siege-bound walls and Prussian lines in the "La Volta." The expedition in question was that organised to observe the Algerian eclipse, and it may be mentioned that it was the British astronomers who had, through the British Ambassador, obtained the necessary



MONSIEUR JANSSEN,
(President of the Paris International Aeronautical Congress.)

At another eclipse in 1871, M. Janssen discovered in the Nilgherry Mountains a new solar envelope which he called the coronal atmosphere.

In 1883, while conducting an eclipse expedition to the Caroline Islands, he proved the reality of the coronal atmosphere by the existence of black Fraunhofer lines in its spectrum.

It was the Franco-Prussian War in 1870 and the Siege of Paris that interrupted the researches of the great astronomer. In the July number of this journal, when speaking of the aeronautical exhibit at the Paris Exhibi-

permission of the Germans to allow M. Janssen to leave Paris at the very moment that he showed the freedom of the air by his aerial enterprise. This famous balloon journey took place on December 2nd at six o'clock in the morning, and the descent was made at Savenay, near the mouth of the Loire, after a journey of five hours. The originality of M. Janssen bore fruit during those few hours in the balloon. It was then that he invented the aeronautical compass, by which the position of the balloon can be perpetually indicated on a map.

It was in 1874, during the expedition to Japan to observe the transit of Venus, that M. Janssen conceived the revolving photographic camera which automatically secured a successive number of images of a moving object. In this ingenious device was foreshadowed the production of animated photography which has now become so popular as an entertainment.

After M. Janssen returned from this expedition, the French Government realized the necessity of founding an establishment where the discoveries in physical astronomy could be facilitated and fostered. In 1875, the Observatory of Physical Astronomy was erected at Meudon, and its management entrusted to M. Janssen, who had created the need of such an Institution.

It is almost needless to say that, under such a master hand, the Observatory at Meudon has attained a great prominence amongst the observatories of the world. At Meudon there are spacious laboratories for the study of the gaseous vapours of our atmosphere and of those of other planets. In them have been studied the spectrum of oxygen, and the law of the square of its density, which determines the appearance of bands in this gas has been therein discovered.

But the greatest scientific achievement of the Meudon Observatory is the development of solar photography that has taken place within its walls. It is said that its laboratories can boast of the possession of more than four thousand solar photographs.

But the feature of M. Janssen's astronomical work which will specially interest the readers of the "Aeronautical Journal," is his efforts to show that one of the most important uses of the balloon is for astronomical research. When clouds or fogs obscure some long awaited celestial phenomena, such as an eclipse or a meteoric display from observers on the earth, it is then that the aeronautical astronomer can penetrate the intervening veil and gain an unclouded vision of the spectacle. For astronomical purposes, a short vertical journey may save the astronomer miles of ordinary travel in search of a transparent atmosphere. M. Janssen, in stimulating the ambitions of aerial astronomers, whether their task is to observe the Leonides or the complex phenomena of total eclipse, has opened out fields of fresh investigation to the student of the heavens.

M. Janssen is a member of the Institute and the Longitudinal Bureau of the Royal Society of London, the Academies of Rome, Brussels, St. Petersburg, etc. He is Commander of the Legion of Honour, of the Rose of Brazil, of the Scientific Order of Merit of Portugal.

M. Janssen was President of the Academy of Science in 1887 and 1888, and in connection with that establishment founded a prize for physical astronomy. He has also founded prizes in connection with the French Geographical, Photographical and Astronomical Societies, of which he has been, in turn, the President. As has well been said of M. Janssen in the "Collection Encyclopédique des Notabilities du XIX. Siecle," the wish of his life has been to serve science, not only by his researches, his discoveries, and his works, but by his endowments for the encouragement for others to follow his footsteps.

2.—MAJOR F. C. TROLLOPE.

Major F. C. Trollope, late Grenadier Guards, who was chosen by the British Government to be the delegate to represent this country at the Paris Aeronautical Congress, and whose portrait and autograph appears as the frontispiece to our Congress number, is the present distinguished and most resourceful superintendent of the balloon factory at Aldershot.

Major Trollope commenced ballooning with the late Mr. Walter Powell, M.P. for Malmesbury, in 1882, and had a narrow escape from sharing in the fatal balloon disaster which befel that latter gentleman. It was merely the unpunctuality of a train that prevented Major Trollope from ascending with Mr. Powell on the occasion that his balloon was wafted out to sea, and with its passenger lost.

From 1883 onwards, Major Trollope has been associated with Colonel Templer in making military war balloons.

In an article in this journal, January 1900, entitled "The Balloon at the Front," mention was made of the perfection to which the British observation war balloon equipment has been brought, and since the issue of that number, the country has had reason to congratulate itself on the existence of the balloon sections, for the assistance that the balloons rendered at Ladysmith, Spion Kop, and other places, cannot well be over-estimated. Major Trollope and his colleagues should command the warmest congratulations of the public for this excellent result of years of experiment and labour carried on for so long in the face

of prejudice, which the South African campaign will now have for ever dissipated.

In 1884, Colonel Macdonald, D.S.O., of Uquanda fame, with above-mentioned officers, brought out the system of compressing hydrogen in small steel tubes for inflating purposes. Major Trollope and the late Major Elsdale, R.E., took these cylinders filled with gas, in 1884, from Chatham out to South Africa, and made many ascents at Mafeking, in Bechuanaland.

3.—M. WILFRED DE FONVIELLE.

As will be seen in another part of this journal, M. De Fonvielle, the late President of La Societe Francaise de Navigation Aerienne, distinguished as aeronaut and scientist, and whose brilliant and classic balloon voyages have delighted the readers of "Travels in the Air," will come specially from Paris to London in April next, to address the members of the Aeronautical Society of Great Britain. In his writings and discourses, so much vivid colour has M. De Fonvielle given to the adventures and charms of ballooning, that, perhaps, he has done more than any other aeronaut to popularize its pursuit.

M. WILFRED DE FONVIELLE.

During Major Trollope's superintendence of the balloon factory at Aldershot, great activity has been in progress in this department, for not only were balloon sections sent out to the South African Campaign, but the necessities of warfare called for the establishment of repairing and gas factories at the seat of war. Then came the Crisis in China to draw afresh upon the resources of the military balloonists, but this latter, even, did not exhaust them, for Major Trollope has recently despatched a show section to Australia for the show there on January 1st.

As we shall so soon have M. De Fonvielle amongst us, and hear in his own words those details of his life and experiences that he will select to tell us, it is hardly suitable for the writer to forestall his own descriptions, and we will rather await with pleasurable anticipation the dramatic fire and rhetoric skill with which M. De Fonvielle never fails to illumine the theme of the balloon.

Perhaps, however, it may be allowable to mention one important feature of M. De Fonvielle's work. He was apparently the first to conceive the great idea of the usefulness of the balloon as an aerial astronomical observatory, the more recent development of which has been already pointed out in the article on M. Janssen.

In "Travels in the Air," page 255, M. De Fonvielle says: "For some time past I had cherished the expectation of observing the interesting phenomenon of falling stars from above the region of the clouds, by means of a balloon. When the aerostat pursues its silent course through the air on a dark November night, it must, indeed, be an interesting moment to the traveller, when hundreds of these small meteors dart across his path—luminous atoms, celestial fires wandering through the immense regions of the atmosphere."

Then he describes how, in November 1867, when he made known his wishes to M. Giffard, that aeronaut generously placed at his disposal, a small balloon, which he endeavoured to fill with pure hydrogen gas, so as to be better suited for the purpose of making journeys long enough to observe the November star showers.

But an imperfection in the apparatus for making the hydrogen caused delay, and M. De Fonvielle mentions how, if it had not been for this unfortunate hitch, he would have risen just as the phenomenon was at its maximum of splendour; as it was, he was obliged to be content with the end of the celestial spectacle.

But a classic writer of old has told us that "the beginning is the half of everything," and though M. De Fonvielle's first astronomical observation was curtailed, yet, undoubtedly to him must be ascribed the inauguration of the Aerial Observatory.

M. LOUIS TRIBOULET.

4.—M. JACQUES FAURE.

M. Jacques Faure, whose picture appears in the group at the heading of the article on

the "Vincennes Competitions," is an illustrious member of the Aero-Club, its Treasurer, and an aeronaut whom no difficulty can discourage. To him belongs the distinction of having been the first member of the Aero-Club to cross the Channel in a balloon, and his own account of his journey from the Crystal Palace appeared in the last number of the "Aeronautical Journal."

M. Faure, accompanied by M. Hervé and M. Mallet, came to England quite lately with his balloon "L'Aero-Club," in which he has made so many journeys, with the intention of crossing the North Sea to Holland; but the very tempestuous weather, followed by contrary winds, necessitated a postponement of the attempt. As will be seen in the announcements of the arrangements for the next General Meeting of the Aeronautical Society, M. Faure has kindly promised to come specially from Paris to read before the members a paper on "Nautical Ballooning," and his exposé is awaited with the keenest interest.

5.—M. LOUIS TRIBOULET.

M. Louis Triboulet was the Secretary of the International Aeronautical Congress, and is now Secretary-General of the Permanent Aeronautical Commission. As Secretary of the Congress, its whole organisation fell to him, and to him we may, therefore, attribute much of its success, and all its order and method. The French gift of grasp and manipulation of detail, is possessed in a high degree by M. Triboulet, who may be described as a master of organisation. To him also fell as Secretary of the French Aeronautical Society, the arrangement of the Society's Exhibits in the Paris Exhibition, and there he might be found last spring, day by day, grouping and classifying, but always ready to receive a foreign brother aeronaut, and to turn and lay at his service all the resources of his official position, and all his knowledge of the Exhibition and the City. One of the objects of the Congress was to promote the growth of friendly feeling between the members of all countries attending it, and the selection of M. Triboulet, as Secretary, went far to further this aim. Individuals who have experienced it can testify to the welcoming charm of manner which made every stranger feel a friend, and to the winning sympathy and knowledge so kindly extended.

M. Triboulet, an architect by profession, is an aeronautical photographer of note. He was the first person to take a photograph from a free balloon, on the 9th of June, 1879. He is the ingenious designer of valuable and successful methods of automatic balloon photography.

M. Triboulet helped to found the Academy of Aerostatic Meteorology, and, in addition to being Secretary-General of the Permanent International Aeronautical Commission and Secretary-General of the French Society of Aeronautical Navigation, is also a Vice-President of that Society, and a Vice-President of the Society of Topography of France.

The International Balloon Ascents.

COMMUNICATED BY P. Y. ALEXANDER.

Strassburg Nov. 12th., 1900.

Ascent Nov. 8th, 1900.

TRAPPES near Paris. Unmanned balloon. Ascent 4.18 a.m., 13,000 metres height=H, Min. T.,—53·6° C. Landed in the Department of Nievre, near Entrains by Nohains.

2nd. Unmanned balloon. Ascent, 8.04 a.m. H., 14,200. Min. T.,—50° C. Landed by Méréville (Seine et Oise).

CHALAIS MEUDON. Manned balloon. Le Commandant Paul Renard, le Cne Borschneck et M. Deslandres, landed in Belgium, near Mons, in 6 hours 20 minutes. Besides meteorological observations, M. Deslandres has also made spectroscopic observations.

2nd. Balloon of paper, unmanned, landed near Orleans.

3rd. Manned balloon. Vallot and Comte de la Vaux. Landed near Brussels. H., 4,800 metres. Min. T.—18° C.

STRASSBURG. Balloon of Paper, unmanned ascended 5.22, landed at 12 noon in Kirchworbis, Province of Sachsen, between Thüringen and Harz Wald, in Nordhausen.

2nd. Manned balloon. Lieutenant Witte and Rentner Stollberg. Ascended 8.05 a.m., landed 1.15 p.m., by Frankeneck, near (Neustadt a/H.). Max. H.,—2,100 metres. Min. T.,—1°.

3rd. Silk Balloon, unmanned. Ascended 8.54 a.m., landed at noon N.W. of Geldhausen, in Hessen. Max. H.,—12,000 metres. Min. T.,—54° C.

MUNICH. Registrir balloon, ascended 8 a.m., landed 10.45, near Maierhof Waldheim, Tachau in Böhmen.

VIENNA. Manned balloon. Oberleutnant Tauber and Dr. Valentin. Ascended 8 a.m. Max. H., 5,000 metres. Min. T.,—12°. Distance travelled, 130 Kms. (kilometres) in 4 hours, 45 minutes. Landed Wischau in Möhren.

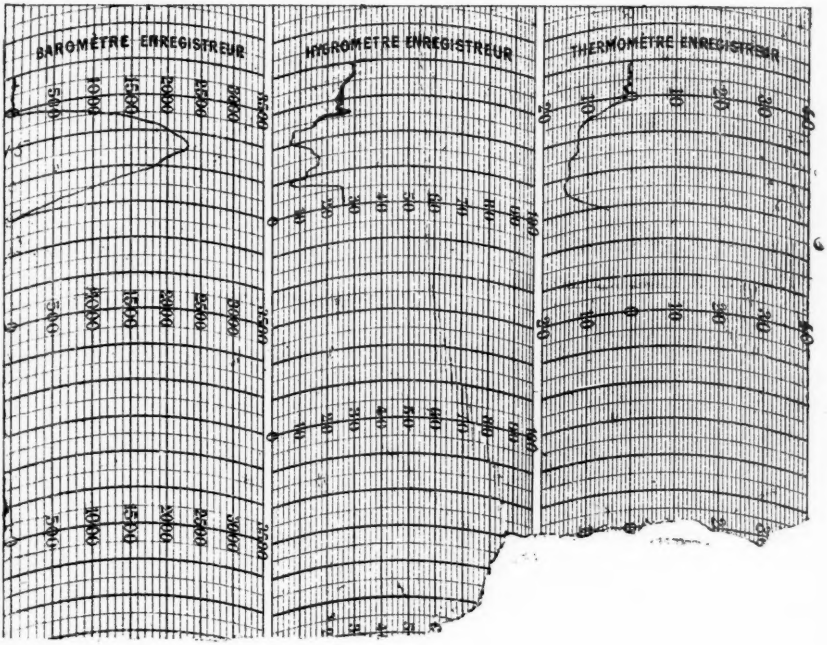
2nd. Manned balloon. His Imperial Highness Archduke Leopold Salvator and Captain Hinterstoissier, ascended at 8. 3,800 metres. Min. T.,—7, 6°. Duration, 5 hours, 30 minutes. 150 Kms. Landed in Temnitz, in Möhren.

BATH. Unmanned balloon. Ascended at noon. Landed at Cricklade, between Cirencester and Swindon, at 12.45. Max. H., 2,300 metres.

2nd. Manned balloon. Spencer, Bacon, and Pierce. Ascended from Crystal Palace. Max. H., 1,500 metres. Min. T., —·0°. Descended Halstead, Essex, in 40 minutes.

BERLIN. Unmanned balloon. Ascended 4.45 a m. Landed at 7 a.m., Ramin, in Pommern, Kreis Randow, 120 Km. N., 35° E of Berlin. Average speed, 9 metres per second. Max. H., 8,005 metres. Min. T.,—36°.

RECORD OF THE FIRST BRITISH BALLON SONDE.



2nd. Manned balloon. Ascended 7.30 a.m. Dr. Berson and Knopp. Landed 4.16 in Hinterpommern. Duration, 8 hours 46 minutes. Distance travelled, 330 Kms. Max. H., 5,900 metres. Min. T.,—21°.

ST. PETERSBURG. Unmanned balloon. Ascended at 8 a.m.

2nd. Manned balloon. Ascended 9 a.m. Max. H., 3,700 metres. Min. T.,—8°. Landed 190 Kms. N.E. direction. Temperature on ground, + 1°; 700 metres high, — 3°; and 1,300 metres high, + 4° ! !

NOTES.

The French Kite which fell in England.—In the July number of this journal, there was a note of a descent of a French kite at Burmash, in Kent. M. Delcourt, the owner of the kite, has written to Mr. Salmon a very interesting letter on the subject, and through Mr. Salmon's courtesy in forwarding this letter to the editor of this journal, it is possible to mention the following details. M. Delcourt ascribes the falling of the kite in England to a sudden increase in the wind force. The cord used, he had tried a few days before with a strain of 35 kilos. On the day it broke, the strain could not have been more than 20 kilos, but any rubbing of the cord at the moment of launching the kite can weaken it at that point, and that was what had probably happened. He thinks that without the cord forming a guide rope attached to it the kite, instead of being carried by a sudden acceleration of wind to fall in England, would have fallen in the sea about three miles only from France. This French experimenter dwells on the difficulty of attaching the cord satisfactorily, and advocates an arrangement that will give greater play to the kite.

Andree's Message.—The "Morning Leader" recently published an interesting facsimile in the original language of Andree's first and last message contained in the buoy picked up in the Arctic Zone on August 31st, and now deposited in the museum at Stockho'm. The message was as follows:—"Buoy No. 4.—The first to be thrown out, 11 July, 10 p.m. Greenwich mean time."

"All well up to now. We are pursuing our course at an altitude of about 250 metres. Direction at first northerly, 10 degrees E.; later, northerly, 45 degrees E. Four carrier pigeons were despatched at 5.40 p.m. They flew westwards. We are now above the ice, which is very cut up in all directions. Weather splendid. In excellent spirits.

"Andree, Strindberg, Frankel.

"[Postscript] later on; above the clouds, 7.45 Greenwich mean time."

As this message is stated to be the first despatched, it is with some reason that the other empty buoys that have been found are supposed to be the testimonies of a disastrous issue to the boldest balloon voyage ever undertaken by man.

The Great Berlin Balloon.—In the July number of this journal, attention was drawn to the preparations in progress in Berlin, for the construction and equipment of a large balloon for a scientific expedition, the principal object of which was to determine the duration of the lifting power of balloons. In the October issue a telegram from Mr. Alexander was published, announcing the departure of the balloon from Friedman on September 24th at 5.53 p.m.

The passengers in the balloon were Dr. Berson and Dr. Suring of the Meteorological Institute, Herr Zekely of Potsdam, and Mr. Alexander, a member of the Aeronautical Society of Great Britain. The car had been provisioned for a six weeks' journey, but the expedition came to an abrupt conclusion during the night after the start, as the drag rope caught in the trees of the forest near Bernau, and the scientists were forced to descend.

The History of the War Balloon.—A contributor to the German "Militai-Wochenblatt," has collected some valuable information concerning the history of the war balloon, which, from its success in South Africa, is now engaging the increased attention of all nationalities. As far back as 1784, General Meusnier appears to have sent up a captive balloon to observe the movements of the enemy. Ten years later, at the siege of Conde, General Chancel wished to employ this means of getting information, but failed to do so, owing to the loss of gas by his balloon, which fell into the hands of the enemy. In 1794, the central balloon school was established at Meudon, under the guidance of Conte and a balloon company was formed, which was employed at he Siege of Maubenge, daily ascents in a captive balloon being made for purposes of observation. This balloon was again used at the Siege of

Charleroi, the battle of Fleurus, and in reconnaissances at Worms, Mannheim, Aix, and Wurzburg, on the surrender of which latter town it fell into the hands of the besiegers. Napoleon, however, disbanded the two balloon companies which had been formed, closed the school at Meudon, and sold the material on hand. Carnot used a captive balloon at the Siege of Antwerp in 1814, and another was used in 1859 on the eve of Solferino. In the Civil War in America, a regular balloon service was organised, as also in 1866, in the war between Paraguay and Brazil. During the Siege of Paris in 1870-7, the use of free balloons was strikingly and usefully demonstrated in enabling 91 persons and 10,000 kilos of letters to be conveyed out of the besieged city. Since that date military balloon establishments have been founded in every European army, and also in America, and it is pointed out that in the development of war balloons, England has certainly led the way.

Balloons were used by the French in the Tonkin Expedition of 1882, and at Bac-Ninh and Hoang-ho in 1884. In the Madagascar Expedition in 1895, a balloon party was taken out, though no actual use appears to have been made of the balloons in that campaign. It is stated that in Germany, in the establishment of a modern military balloon department, many obstacles had to be surmounted, and many prejudices to be fought, before, in June, 1884, an experimental captive balloon station could be created by the Ministry of War, and, even after this, two years elapsed before a regular balloon detachment was formed, attached to the railway regiment, and placed at the disposition of the general staff. Only in 1887 was a special uniform allotted to the military balloonists. The writer of the article thinks that the present German captive military balloon is unquestionably the best extant, and claims that it is capable of ascending to great heights, and possesses great stability even in windy weather.

The Italian Experiments in Firing on War Balloons.—The Italian Government have recently conducted some experiments at the camp of San Maurizio, to ascertain the effect of fire on balloons, the trials being made under Colonel Danione. Fortress guns of various calibre were used. In the first experiment, 9-cm guns were used, which were fired at a captive balloon at a distance of about three kilometres, and at an elevation of 300 metres. One sharpnell sufficed to bring the balloon down. In the second experiment bronze position guns of 12-cm. calibre were used, the distance being five kilometres, and the balloon 500 metres high. Six or seven shots severed the cable holding the captive balloon, which broke loose. In the third experiment, 15-cm. guns were used, and an identical result obtained.

The experimenters have concluded that it could be made practically impossible for an enemy to make observations of the interior of a fortified position. It has, however, been pointed out that, though it may be easy to hit a stationary balloon, it becomes a very difficult matter when motion is imparted to the balloon. The danger would, therefore, be in still weather, and in such meteorological conditions when motion is not given to the balloon by the wind, it becomes expedient to impart movements to the balloon. Experience has, however, shown that a moving free balloon is difficult to hit. In the case of the free balloons that escaped during the Siege of Paris, the Germans manufactured special "balloon guns," which could be fired at a very high angle of elevation, and with which they hoped to destroy many of the balloons, but the missives never once hit the aerial targets.

The Value of Pure Oxygen in High Balloon Ascents.—The advantage of inhaling pure oxygen in high balloon ascents was fully realised by M. Jaques Balsan and M. Godard in their high ascent in connection with the Paris Exhibition competitions. At about 18,000 feet, the aeronauts both began to feel disagreeable sensations, their temples ached, their faces grew pale, and objects were blurred before their eyes. At 20,150 feet, M. Jacques Balsan was practically prostrated, and could not speak or get to his bag of vivifying oxygen. M. Godard handed the bag to him,

and in a minute he was completely recovered. Pursuing their upward course, M. Godard, in his turn succumbed, and was apparently paralysed. He, too, revived when he imbibed the oxygen. By both keeping the oxygen tubes in their mouth, the intense sufferings of breathing the upper atmosphere was avoided. The diary of the aeronauts runs as follows:—"20,950 feet, we feel better, thanks to the oxygen tubes we keep in our mouths. 21,450 feet, the cold is intense, our beards are covered with ice. 22,400 feet, we are both in pain and unable to speak a word." This was, however, their limit of endurance. It is stated that at that height, it required their united efforts to enable one of them to step on to a bag of ballast. It is hardly surprising, therefore, that the aeronauts decided to descend. It is, however, stated that Comte de la Vaulx claims that he ascended in his balloon to an altitude of 24,000 feet.

London Institution Lectures.—The annual winter series of lectures at the London Institution includes a lecture by Mr. Eric Stuart Bruce, on "Modern Aeronautics" illustrated by lantern views, working models, and experiments. This lecture will be delivered in the theatre of the Institution, on Thursday, January 17th at 6 p.m.

Royal Institution Friday Evening Discourses.—On February 8th, the Royal Institution will again devote a Friday evening discourse tg the subject of The Subjugation of the Air, when Professor G. H. Bryan S.C.D., F.R.S., will lecture on the "History and Progress of Aerial Locomotion."

Publications Received.

"Vertical Gradients of Temperature, Humidity, and Wind Direction." A preliminary report on the kite observations of 1898. Department of Agriculture, Weather Bureau, Washington, United States, America.

"Sounding the Ocean of Air," by A. Lawrence Rotch, S.B., A.M. Society for Promoting Christian Knowledge, London.

"By Land and Sky," by the Rev. John M. Bacon, M.A., F.R.A.S. Isbister and Co., Tavistock Street, London.

These three works will be fully reviewed in the next number of this journal.

Owing to pressure on space the accounts of the latest experiments with the Zeppelin Airship, the lists of Foreign Periodicals, and Notable Articles will be reserved for the next number.

Applications for Patents.

(*From October 1st, 1900.*)

The following List of Applications for Patents connected with Aeronautics has been specially compiled for the *Aeronautical Journal* by Messrs. Bromhead & Co., Patent Agents, 33, Cannon Street, London, E.C.:—

17,367 of 1900. Louis Gathman. Improvements Relating to Flying Machines.

17,371 of 1900. Emil Lehmann. Improvements in and Relating to Flying Apparatus.

18,487 of 1900. George Howard Wright. Improvements in or Relating to the Moving of Balloons, Flying Machines, and the like.

17,961 of 1900. Edward Anderson. Improvements in Balloons and Flying Machines.

18,287 of 1900. Andrés Vegara. A New or Improved Flying Machine.

18,837 of 1900. Josef Birk. Improvements in or Relating to Balloons.

18,954 of 1900. ELEANOR, MARIA, LANSDOWN CASE, and FRANK JAMES GRAY. **Apparatus for Giving Warning of an Alteration in the Steering of a Vessel, Balloon, or like.**

19,424 of 1900. JEAN TARBE. **Improvements in Aeroplanes.**

20,336 of 1900. ALBERT TIETZ. **Aerostatic Improvements.**

20,952 of 1900. EDWARD EUGENE DULIER. **An Aerial Soaring and Travelling Apparatus.**

21,947 of 1900. CASSIUS MONTEZUMA, Richmond. **Improvements in Airships.**

22,046 of 1900. IZMAY MASSEY. **Aerial Signalling and Aerial Advertisements.**

22,120 of 1900. ANDRÉS VEGARA. **Improvements in Wings of Flying Machines and like.**

22,444 of 1900. GEO. GRANT. **Improvements in Means for Steering Aerial Yacht.**